

What is claimed is:

- 2 1. A method for transporting files from a cable headend, comprising:
3 transforming respective filenames of said files into respective file identifiers,
4 each of said file identifiers comprising a packet identifier (PID) associated with a
5 communications channel selected to transport said file; and
6 wherein said file identifiers are adapted to enable receivers of said
7 communications channels to selectively receive a file by processing the
8 communications channel associated with the file.
- 1 2. The method of claim 1, wherein said communications channel
2 transports an MPEG 2 bitstream.
- 1 3. The method of claim 1, wherein said communications channel
2 transports Digicipher II data packets.
- 1 4. The method of claim 1, wherein said communications channel
2 transports SI data packets.
- 1 5. The method of claim 1, wherein step (a) includes generating a
2 number with an approximately uniform probability distribution.
- 1 6. The method of claim 1, wherein a first portion of the number is
2 included in the packet as a payload identifier.
- 1 7. The method of claim 6, wherein a second portion of the number is
2 included in the packet as a multicast identifier.
- 1 8. The method of claim 7, further comprising:
2 detecting a collision condition in which at least two packets are
3 transmitted having the same multicast identifier, each having a respectively
4 different bit sequence associated therewith,
5 transmitting information associating one of the at least two packets
6 with a non-colliding multicast identifier;
7 transmitting the one packet using the non-colliding multicast identifier.
- 1 9. The method of claim 8, wherein the non-colliding multicast identifier is
2 formed by adding a constant to the multicast identifier for which the collision
3 condition is detected.
- 1 10. The method of claim 1, wherein the bit sequence is a file identifier.

1 11. The method of claim 1, further comprising:
2 calculating the program identifier based on one of the group consisting of a
3 cyclic redundancy code, a hash function and a pseudorandom number formed from
4 the file name.

1 12. The method of claim 11, wherein step (a) comprises:

2 (i) determining a program identifier by the equation:

3 PID index = X modulo NPIDSON,

4 where PID is the program identifier, X is a result of performing at least one
5 XOR operation on two or more portions of the one of the group consisting of a
6 cyclic redundancy code, a hash function and a pseudorandom number, and
7 NPIDSON is a number of packet processors to which payload files are being sent;
8 (ii) performing a table lookup using PID index as a lookup parameter;
9 and
10 (iii) adding an offset to a value output by the table lookup.

1 13. The method of claim 11, further comprising transmitting a program
2 identifier usage bitmap that identifies which program identifiers are being used to
3 transmit payload data.

1 14. The method of claim 11, further comprising:

2 selecting at least one portion of the one of the group consisting of a
3 cyclic redundancy code, a hash function and a pseudorandom number; and
4 transmitting along with a unit of payload data a payload identifier
5 comprising the selected portion.

1 15. The method of claim 11, wherein the at least one packet is
2 transmitted using a multicast identifier formed from at least one portion of the one
3 of the group consisting of a cyclic redundancy code, a hash function and a
4 pseudorandom number.

1 16. The method of claim 15, wherein the multicast identifier is formed by
2 performing an XOR operation on two non-contiguous portions of the one of the
3 group consisting of a cyclic redundancy code, a hash function and a
4 pseudorandom number.

1 17. The method of claim 1, wherein the payload data include one of the
2 group consisting of Moving Picture Experts Group (MPEG) 1 packets and MPEG 2
3 packets.

1 18. The method of claim 1, wherein:
2 a program identifier is calculated from at least a portion of a cyclic
3 redundancy code calculated from a file name associated with at least one packet of
4 payload data to be transmitted; and
5 step (c) includes transmitting the at least one packet of payload data
6 to a packet processor that is identified by the program identifier.

1 19. A method for receiving a desired packet associated with a bit
2 sequence from a server, comprising the steps of:

3 (a) calculating a data identifier from the bit sequence associated with the
4 desired packet; and

5 (b) using the data identifier to receive the packet identified by the data
6 identifier.

1 20. The method of claim 19, wherein step (a) includes calculating the
2 data identifier based on a common function that is also used by the server to
3 calculate the data identifier when the server determines which data identifier to
4 assign to the packet.

1 21. The method of claim 20, wherein the data identifier is formed from
2 one of the group consisting of a cyclic redundancy code, a hash function and a
3 pseudorandom number generated using the bit sequence as an input, further
4 comprising:

5 selecting at least one portion of the data identifier as a payload
6 identifier; and

7 detecting payload data having the payload identifier transmitted
8 therewith as the desired data.

1 22. The method of claim 20, wherein the packet is received using a
2 multicast identifier formed from at least one portion of a one of the group consisting
3 of a cyclic redundancy code, a hash function and a pseudorandom number
4 generated using the bit sequence as an input.

1 23. The method of claim 22, further comprising:
2 detecting a collision condition in which a received packet has a
3 multicast identifier that matches the multicast identifier generated using the bit
4 sequence, but a payload identifier associated with the received packet is different
5 from the a selected portion of the data identifier;
6 receiving a transmission associating the one of the group consisting
7 of a cyclic redundancy code, a hash function and a pseudorandom number with a
8 non-conflicting multicast identifier; and
9 receiving the desired packet using the non-colliding multicast
10 identifier.

1 24. The method of claim 19, wherein step (a) includes calculating a 64 bit
2 number, of which a payload identifier is a portion.

1 25. A method for transmitting data, comprising the steps of:

2 (a) calculating a plurality of program identifiers based on respective bit
3 sequences associated with respective sets of at least one packet;

4 (b) associating each set of at least one packet with the respective
5 program identifier calculated from the bit sequence for that set of at least one
6 packet; and

7 (c) transmitting to a receiver associated with one of the plurality of
8 program identifiers a list including a respective data identifier for each set of at
9 least one packet associated with the same program identifier as the receiver.

1 26. The method of claim 25, wherein step (a) includes generating a
2 number with an approximately uniform distribution using a file name as an input.

1 27. The method of claim 25, wherein each packet has a multicast
2 identifier that is calculated based on the bit sequence associated with the packet,
3 the method further comprising:

4 detecting a collision condition in which at least two packets are
5 transmitted having the same multicast identifier, each of the at least two packets
6 having a respectively different bit sequence associated therewith,

7 transmitting information associating one of the at least two packets
8 with a non-colliding multicast identifier;

9 transmitting the one packet using the non-colliding multicast identifier.

1 28. A method for receiving data, comprising the steps of:

2 (a) calculating a program identifier based on a bit sequence associated
3 with a desired set of at least one packet, the program identifier being associated
4 with a receiver of the set of at least one packet; and

5 (b) receiving a list associated with the program identifier, the list
6 containing a plurality of data identifiers, each data identifier in the list
7 corresponding to a respective set of at least one packet that is to be received using
8 that program identifier.

1 29. The method of claim 28, further comprising;

2 receiving a program identifier usage bitmap that identifies which
3 program identifiers are being used to transmit payload packets;

4 determining whether the desired set of at least one packet is
5 available using the program identifier usage bitmap and the calculated program
6 identifier.

1 30. The method of claim 29, further comprising:

2 detecting a file-not-found condition if the calculated program identifier
3 for the desired set of at least one packet is identified as not being used to transmit
4 data in the program identifier usage bitmap.

1 31. The method of claim 29, further comprising:

2 detecting a file-not-found condition if the calculated program identifier
3 for the desired set of at least one packet is identified as being used to transmit data
4 in the program identifier usage bitmap, and the data identifier corresponding to the
5 desired set of at least one packet is not included in the list containing the plurality
6 of data identifiers for that receiver.

1 32. A system for transmitting at least one file from a sender to a receiver,
2 the system comprising:

3 a sender storage medium for storing said at least one file, said at
4 least one file having a corresponding file identifier;

5 a converter for converting the contents of said at least one file into at
6 least one bit stream to be transmitted;

7 a sender transformer for providing a key based on said file identifier;
8 said converter incorporating said key into said bit stream for
9 transmission to said receiver.

1 33. The system of claim 32 wherein said receiver is configured to select
2 said said at least one file by means of said data identifier.

1 34. The system of claim 32, wherein the server transmits a program
2 identifier usage bitmap that identifies which program identifiers are being used to
3 transmit payload data.

1 35. The system of claim 32, wherein the system further comprises a
2 receiver that includes:

3 a processor for calculating the program identifier for a desired set of
4 at least one packet using the same calculation used by the server to calculate the
5 program identifier for the at least one packet, and

6 the processor detects a file-not-found condition if the program
7 identifier for the desired at least one packet is not listed in the program identifier
8 usage bitmap as being used to transmit payload data.

1 36. A system for receiving data, comprising:

2 a client processor that calculates a payload identifier based on a bit
3 sequence associated with a given set of at least one packet,

4 the client processor using the payload identifier to receive the given
5 set of at least one packet from a server.

1 37. The system of claim 35, wherein the client processor generates a
2 number with an approximately uniform probability distribution, and the payload
3 identifier is at least a portion of the generated number.

1 38. The system of claim 37, wherein a second portion of the generated
2 number is used as a multicast identifier.

1 39. The system of claim 38, wherein the client includes:

2 means for detecting a collision condition in which a received packet
3 has a multicast identifier that matches the multicast identifier generated using the
4 bit sequence, but a payload identifier received with the packet is different from the
5 payload identifier calculated by the client processor,

6 mean for receiving information associating the desired set of at least
7 one packet with a non-colliding multicast identifier;

8 means for receiving the desired packet using the non-colliding
9 multicast identifier.

1 40. The system of claim 36, wherein the bit sequence is a file identifier.

1 41. The system of claim 36, wherein the bit sequence is a filename and
2 the client calculates the data identifier based on one of the group consisting of a
3 cyclic redundancy code, a hash function and a pseudorandom number formed from
4 the file name.

1 42. A computer readable medium encoded with computer program code,
2 wherein when the computer program code is executed by a server processor, the
3 server processor performs a method for transmitting a packet associated with a bit
4 sequence, comprising the steps of:

- 5 (a) calculating a data identifier based on the bit sequence;
6 (b) assigning the data identifier to the packet; and
7 (c) transmitting said packet to a receiver using the data identifier.

1 43. A method of transmitting payload data from a headend to a television
2 converter, comprising the steps of:

3 spinning a plurality of data units from the group consisting of packets
4 and files without transmitting a directory of all of the data units being spun; and

5 calculating information used to spin the units of data by a common
6 calculation that is used by the television converter to receive the units of data
7 without a directory of all of the data units being spun.

1 44. In a system including at least one file storage medium, said file
2 storage medium including at least one file to be transported from a file sender to a
3 file receiver, wherein each of said at least one files to be transported has
4 associated therewith a corresponding file identifier, a sender comprising:

- 5 a packetizer,
6 a transform;
7 a mulitplexer;

8 at least one file manager communicating with said file storage
9 medium, said packetizer and said transform such that said files on said file storage
10 medium are provided to said packetizer and said corresponding filenames are
11 provided to said transform,

12 said packetizer providing at least one corresponding data
13 packet comprising said file to said multiplexer;

14 said transform providing a packet identifier based upon said
15 corresponding filename to said multiplexer;

16 for each file to be transported said multiplexer providing a
17 packetized bitstream including said at least one file to be transported, each packet
18 of said bitstream including said file identifier and at least a portion of said file.

1 45. The system of claim 44 further including a data carousel in
2 communication with said packetizer and said multiplexer, wherein said packetizer
3 provides said packets to said data carousel based upon said corresponding file
4 identifier.

1 46. In a system including at least one file storage medium including at
2 least one file to be transported from a sender to a receiver, wherein each of said at
3 least one files to be transported has associated therewith a corresponding file
4 identifier, a receiver comprising:

5 at least one tunable filter;

6 a transform;

7 a processor; programmed to utilize said at least one file to be
8 transported; said processor providing said filename of said at least one file to be
9 utilized to said transform;

10 said transform providing a packet identifier corresponding to
11 said at least one filename to a tunable filter such that said tunable filter selects
12 packets comprising said file and provides said selected packets to a packet
13 processor, said packet processor providing said file to said processor.